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Occipital condyle fracture as a rare cause of shoulder pain

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ABSTRACT

Occipital condyle fractures (OCFs) usually occur due to high energy trauma and are often associated with serious injuries, particularly in the brain. Because it is difficult to determine this fracture on plain radiographs, it can easily be misdiagnosed. In this report, we present a patient admitted to our emergency department with one and only complaint of shoulder pain following a motor vehicle accident. We aimed to underline the importance of physician's elaboration and attention in the diagnosis of this rare entity.

Introduction

Occipital condyle fracture (OCF) is a rare condition which cannot be determined by conventional X-ray imaging and requires confirmation by computed tomography (CT) [1]. Especially in the emergency department (ED) setting, diagnoses of OCFs pose a challenge due to lack of diagnosis [2]. In patients with trauma to head and neck, suspicion of the clinician is the mainstay of diagnosis of OCF. Also, careful investigation of the craniocervical junction prevents this fracture from going undetected. In this paper, we present a case of OCF in a 35-year-old female patient with a complaint of shoulder pain who suffered head trauma following a motor vehicle accident.

Case presentation

A 35-year-old female was admitted to the ED with shoulder pain following a car accident about an hour ago. There was no history of any significant illness. On physical examination, her vital signs were as follows; blood pressure: 120/80 mmHg, pulse rate: 76 beats/minute, respiratory rate: 20 breaths/minute, and temperature: 36.5 °C. On admission, the patient was alert and oriented. All other physical findings and neurologic examination were normal. The routine laboratory examination findings were normal.

Due to exposure to high-energy trauma, bidirectional cervical and thoracolumbar, and pelvis X-rays were obtained. On X-ray images, any pathological finding was not determined. The patient was able to move his shoulder in all directions, so an injury of the shoulder was not suspected. The patient developed a complaint of nausea and vomited twice in the ED. So, to avoid a possible intracranial lesion, a brain CT was performed. When the CT was evaluated, any pathological finding was not determined in the parenchyma, however, when bone structure was evaluated, minimally depressed linear fracture of the right occipital condyle was determined (Fig. 1a, b). In addition, a cervical Magnetic Resonance Imaging (MRI) was obtained. Fracture of the condyle was confirmed (Fig. 2).

After clinical and radiological evaluation, according to the Anderson and Montesano classification Type 1 occipital condyle fracture was diagnosed. Then, the patient consulted with neurosurgery and was hospitalized for observation. The patient underwent conservative therapy with neck support for three days and was discharged from the hospital with hard collar and follow-up recommendation.

Occipital condyle fractures usually occur due to either high-speed deceleration of the head or direct high-energy trauma to the cranium. The anatomical localization of the OCF is closely related to the complaint and clinical findings of the patient on admission. Patients with OCF may present either with complaints such as headache, neck pain, limitation of the occipitocervical movements, acute torticollis, respiratory failure due to retropharyngeal hematoma and alteration in the mental status, or secondary to trauma without any complaints [2–5]. In our case, the patient was admitted to our ED due to shoulder pain due to motor vehicle accident. It is not quite clear whether the shoulder pain is associated with the Occipital Condyle Fracture, however, a traumatic cervical ("whiplash-type") injury with muscle strain might present as a shoulder pain. As such, the shoulder pain has been an indirect indication of an injury at the craniocervical junction.

The exact prevalence of this fracture is unknown, and the incidence, among that of severe craniocervical injuries, is reported to range from 4% to 19% [6]. OCFs are diagnosed twice as often in males than in females, with mean age at presentation between 32 and 33 years [7]. In our case, the patient was a 35-year-old female. In a

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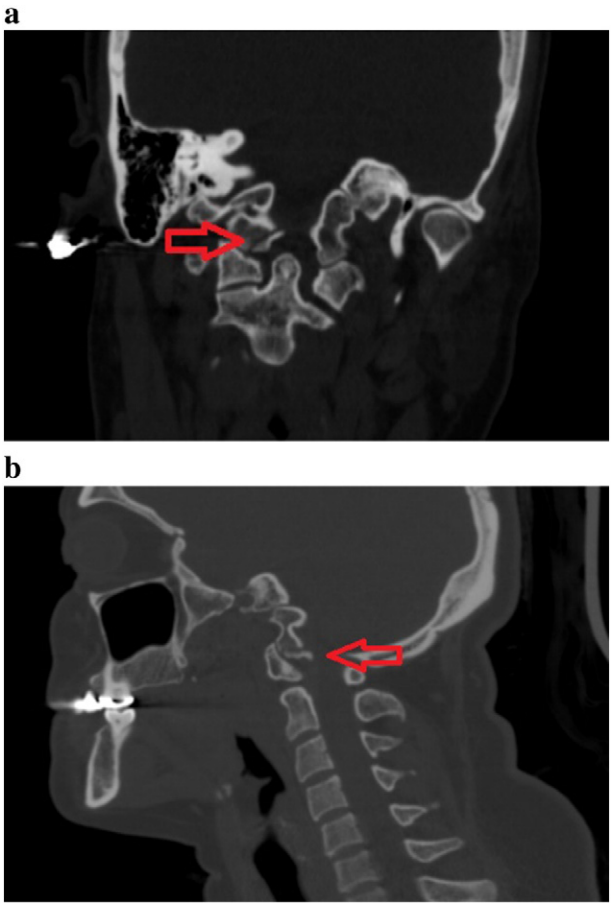

Fig. 1. a. The arrow shows the fracture of the occipital condyle on coronal plain cervical CT of the patient. **b**. The arrow shows the fracture of the occipital condyle on sagittal plain cervical CT.

study by Mueller et al. [8], the cause of OFCs in 21 out of 31 cases (67.7%) was found to be high speed trauma due to traffic accident. The patient in our case also suffered a high energy trauma, however, she had no abnormal finding indicating a concomitant severe injury.

The major cause for OCF is known to be high speed trauma often associated with serious injuries, severe traumatic brain injury in particular [8]. In their study, Mueller et al. [8] reported that among 31 patients involved in the study, there was no case of isolated OCFs; all patients showed additional, sometimes severe brain injury. The increasing use of CT imaging results in an increase of the prevalence of this fracture because the diagnosis of OCF usually remains unrecognized as it is rarely identified on plain radiographs [5,6]. In our case, similarly, a CT scan was performed to exclude any intracranial pathology and the OCF was detected coincidentally. The OCF could not have been detected on lateral X-ray of the cervical spine. CT scans are now considered the gold standard in diagnosing this entity, helping to identify any displacement or bleeding in the affected area [9,10].

Limited knowledge of this entity, insufficiency of plain radiographs in diagnosis and incomplete physical examination may cause lack of identification of OCF. Loss of consciousness may result in sub-optimal physical examination. While neck pain may be the only complaint, some patients present with neurological deficits [11]. Loss of consciousness did not occur in our patient and the only complaint was pain on the shoulders instead of neck. Anderson and Montesano [12] distinguished among three types of fractures: type 1 was described as a compression fracture of the condyle, without significant displacement into the foramen magnum. Type 2 was described as a basilar skull fracture with extension into the occipital condyle, without displacement into the foramen magnum. Both types are found to be a stable entity. Type 3 was characterized as an avulsion fracture of the occipital condyle secondary to stress on the ipsilateral alar ligament. According to this classification, fracture in our case is involved in type 1. It is known that treatment of stable OCFs (Type 1 and 2) is conservative [2]. Our case was also treated conservatively with close follow-up performed by the neurosurgery.

Conclusion

Occipital condyle fracture can easily be overlooked if the clinician does not suspect. Computerized tomography is the gold standard in the diagnosis of this entity. Although it is often associated with serious injuries such as severe traumatic brain, shoulder pain, as presented in our case, may be the unique complaint on admission.

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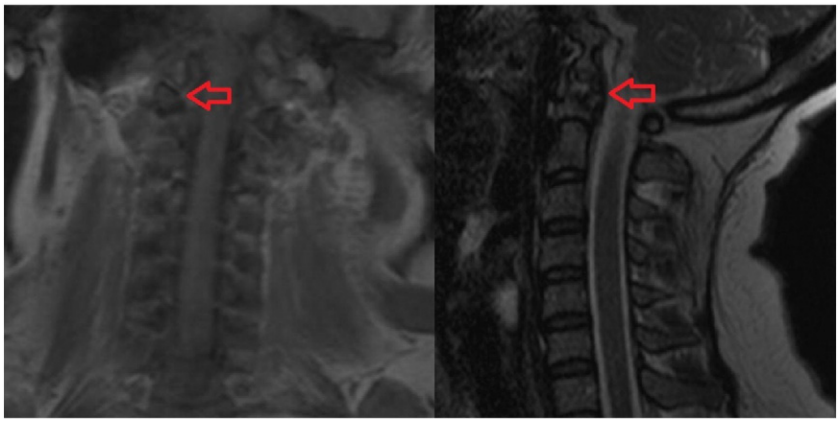

Fig. 2. T1-weighted MRI of the patient demonstrating the OCF.

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